

CARBON NANOTUBE ELECTRON IONIZATION SOURCES

Abstract

An ion source for use in a mass spectrometer includes an electron emitter assembly configured to emit electron beams, wherein the electron emitter assembly comprises carbon nanotube bundles fixed to a substrate for emitting the electron beams, a first control grid configured to control emission of the electron beams, and a second control grid configured to control energies of the electron beams; an ionization chamber having an electron-beam inlet to allow the electron beams to enter the ionization chamber, a sample inlet for sample introduction, and an ion-beam outlet to provide an exit for ionized sample molecules; an electron lens disposed between the electron emitter assembly and the ionization chamber to focus the electron beams; and at least one electrode disposed proximate the ion-beam outlet to focus the ionized sample molecules exiting the ionization chamber.

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